

iu-99.ST25.txt  
SEQUENCE LISTING



<110> Indiana University Research and Technology Center  
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 <120> P193 PROTEINS AND NUCLEIC ACIDS, AND USES THEREOF  
 <130> IU-99-PCT-US  
 <140> 10/080,943  
 <141> 2002-02-22  
 <150> PCT/US00/23161  
 <151> 2000-08-23  
 <150> US 60/150,266  
 <151> 1999-08-23  
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 <170> PatentIn version 3.3  
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ggc ttg cac gcg tat ccg gat gaa ttg atc cgc caa cgg gtt ggc cat Gly Leu His Ala Tyr Pro Asp Glu Leu Ile Arg Gln Arg Val Gly His 20               25               30	109
ggc ttg cac gcg tat ccg gat gaa ttg atc cgc caa cgg gtt ggc cat Gly Leu His Ala Tyr Pro Asp Glu Leu Ile Arg Gln Arg Val Gly His 20               25               30	157
aat ggg cac ccc gag tat cag atc cgc tgg ctc atc ctc agg cgc ggg Asn Gly His Pro Glu Tyr Gln Ile Arg Trp Leu Ile Leu Arg Arg Gly 35               40               45	205
gat gat ggg gac cgg gac tct aca gtg gac tgc aag gct gag cat atc Asp Asp Gly Asp Arg Asp Ser Thr Val Asp Cys Lys Ala Glu His Ile 50               55               60	253
ctg tta tgg atg tct gac gat gag atc tat gcc aac tgc cac aag atg Leu Leu Trp Met Ser Asp Asp Glu Ile Tyr Ala Asn Cys His Lys Met 65               70               75               80	301
ctg ggc gag aat ggc caa gtc atc gca cct tcc cgg gag tcc act gag Leu Gly Glu Asn Gln Val Ile Ala Pro Ser Arg Glu Ser Thr Glu 85               90               95	349
gca ggg gcc ctc gac aag tct gtg ctg ggg gag atg gaa aca gat gtg Ala Gly Ala Leu Asp Lys Ser Val Leu Gly Glu Met Glu Thr Asp Val 100              105              110	397

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Lys Ser Leu Ile Gln Arg Ala Leu Arg Gln Leu Glu Glu Cys Val G1y	
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acc gtg cct cct gcc cct ctc ctt cac acg gtc cat gta ctc agt gcc	493
Thr Val Pro Pro Ala Pro Leu Leu His Thr Val His Val Leu Ser Ala	
130 135 140	
tat gcc agc atc gag ccc ctc act ggc atc ttc aaa gac cgc agg gtt	541
Tyr Ala Ser Ile Glu Pro Leu Thr Gly Ile Phe Lys Asp Arg Arg Val	
145 150 155 160	
gtg aac ttg ctc atg cac atg ttg agc agt cct gat tat cag atc cgc	589
Val Asn Leu Leu Met His Met Leu Ser Ser Pro Asp Tyr Gln Ile Arg	
165 170 175	
tgg agc gca ggc cgg atg atc caa gct ctg tcc tcc cac gat gct ggg	637
Trp Ser Ala Gly Arg Met Ile Gln Ala Leu Ser Ser His Asp Ala Gly	
180 185 190	
acc cgg acc cag atc ctt ctg tca ttg agc caa caa gag gcc att gaa	685
Thr Arg Thr Gln Ile Leu Leu Ser Leu Ser Gln Gln Glu Ala Ile Glu	
195 200 205	
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Lys His Leu Asp Phe Asp Ser Arg Cys Ala Leu Leu Ala Leu Phe Ala	
210 215 220	
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Gln Ala Thr Leu Thr Glu His Pro Met Ser Phe Glu Gly Val Gln Leu	
225 230 235 240	
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Pro Gln Val Pro Gly Arg Leu Leu Phe Ser Leu Val Lys Arg Tyr Leu	
245 250 255	
cac gtc acc ttc ctc ctg gat cgg ctg aac ggc gat gca ggg gat caa	877
His Val Thr Phe Leu Leu Asp Arg Leu Asn G1y Asp Ala G1y Asp Gln	
260 265 270	
gga gcc cag aac aac ttt agt cct gag gag ttg aat gta ggg agg ggc	925
Gly Ala Gln Asn Asn Phe Ser Pro Glu Glu Leu Asn Val Gly Arg Gly	
275 280 285	
cgg ctg gaa ctg gaa ttc agt atg gcc atg ggc act ctg atc tct gag	973
Arg Leu Glu Leu Glu Phe Ser Met Ala Met Gly Thr Leu Ile Ser Glu	
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Leu Val Gln Ala Met Arg Trp Asp Gly Ala Ser Ser Arg Pro Glu Ser	
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Ser Ser Ser Thr Phe Gln Pro Arg Pro Ala Gln Phe Arg Pro Tyr	
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340 345 350	
gcc agt ttt aat acc tat gcc ttg tat gtg cgg gac acg ctg cgg ccc	1165
Ala Ser Phe Asn Thr Tyr Ala Leu Tyr Val Arg Asp Thr Leu Arg Pro	

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370	375	380	
gat gag ggc cag ttc cga cag agc aat gat ggc gtt ccc cca gc <sup>g</sup> cag Asp Glu Gly Gln Phe Arg Gln Ser Asn Asp Gly Val Pro Pro Ala Gln			1261
385	390	395	400
gtg ttg tgg gat tca aca ggc cat acc tac tgg gtg cac tgg cac atg Val Leu Trp Asp Ser Thr Gly His Thr Tyr Trp Val His Trp His Met			1309
405	410	415	
ctg gag atc ttg ggc ttt gag gaa gac atc gag gat gtg att gat att Leu Glu Ile Leu Gly Phe Glu Glu Asp Ile Glu Asp Val Ile Asp Ile			1357
420	425	430	
gaa gag tta cag gag cta ggg gcc aat gga gca ctg agc atc gtc ccg Glu Glu Leu Gln Glu Leu Gly Ala Asn Gly Ala Leu Ser Ile Val Pro			1405
435	440	445	
ccg tcc cag cgc tgg aag ccc ata act cag ctc ttt gcc gag cct tac Pro Ser Gln Arg Trp Lys Pro Ile Thr Gln Leu Phe Ala Glu Pro Tyr			1453
450	455	460	
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465	470	475	480
gct gag tgg tgg gag ctc ctc ttc atc cgg cag ttg agt gag gca Ala Glu Trp Trp Glu Leu Leu Phe Phe Ile Arg Gln Leu Ser Glu Ala			1549
485	490	495	
gag cgc ctt cac atc gtg gat ctc ctg caa gac cac ctg gaa gag gag Glu Arg Leu His Ile Val Asp Leu Leu Gln Asp His Leu Glu Glu Glu			1597
500	505	510	
cg <sup>c</sup> gtt ctg gac tac gat atg ctg cct gag ctg acc gtg ccc gtt gac Arg Val Leu Asp Tyr Asp Met Leu Pro Glu Leu Thr Val Pro Val Asp			1645
515	520	525	
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530	535	540	
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545	550	555	560
gaa gtc ctg gta ggg cat cta agc tac cca ttt gtg cca ggt gcc cag Glu Val Leu Val Gly His Leu Ser Tyr Pro Phe Val Pro Gly Ala Gln			1789
565	570	575	
cca aat tta ttc gga gcc aat gaa gag tct gaa gcc aaa gat ccc cca Pro Asn Leu Phe Gly Ala Asn Glu Glu Ser Glu Ala Lys Asp Pro Pro			1837
580	585	590	
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595	600	605	
ccc gaa ggg gag gtc ctt gtg gaa ctg gaa caa gcc ctc ggc tcc gag			1933

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gct	ccc	cag	gaa	act	gag	gtc	aag	tcc	tgc	ttg	ttg	cag	ctc	cag	gag		1981		
Ala	Pro	Gln	Glu	Thr	Glu	Val	Lys	Ser	Cys	Leu	Leu	Gln	Leu	Gln	Glu				
625					630					635					640				
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Gln	Pro	Gln	Pro	Phe	Leu	Ala	Leu	Met	Arg	Ser	Leu	Asp	Thr	Ser	Ala				
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agc	aac	aag	acc	ctg	cac	ctc	act	gtg	ctc	aga	atc	tta	atg	cag	ctg		2077		
Ser	Asn	Lys	Thr	Leu	His	Leu	Thr	Val	Leu	Arg	Ile	Leu	Met	Gln	Leu				
					660				665			670							
gtg	aac	ttc	cca	gag	g	cg	ctg	ttg	cta	ccc	tgg	cac	gag	gcc	atg	gat		2125	
Val	Asn	Phe	Pro	Glu	Ala	Leu	Leu	Leu	Pro	Trp	His	Glu	Ala	Met	Asp				
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gcc	tgc	gtg	acc	tgc	ctt	cg	tcc	ccc	aat	act	gac	cga	gag	gtg	ctc		2173		
Ala	Cys	Val	Thr	Cys	Leu	Arg	Ser	Pro	Asn	Thr	Asp	Arg	Glu	Val	Leu				
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cag	gaa	cta	atc	ttt	ttc	ctg	cac	cg	ctg	acc	acc	aca	agc	cg	gac		2221		
Gln	Glu	Leu	Ile	Phe	Leu	His	Arg	Leu	Thr	Thr	Thr	Ser	Arg	Asp					
					705		710			715			720						
tat	g	cg	gt	at	ct	a	ac	cag	cat	g	ga	g	cc	g	cc	at	tcc	aaa	2269
Tyr	Ala	Val	Ile	Leu	Asn	Gln	His	Gly	Ala	Arg	Asp	Ala	Ile	Ser	Lys				
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gtc	ctg	gaa	aag	cac	cga	gg	aaa	ctg	gag	ttg	g	ct	gag	ctg	cg			2317	
Val	Leu	Glu	Lys	His	Arg	Gly	Lys	Leu	Glu	Leu	Ala	Gln	Glu	Leu	Arg				
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gat	atg	gt	tcc	aag	tgt	gag	aag	cat	g	cc	cac	ctc	tac	cg	aaa	ctc		2365	
Asp	Met	Val	Ser	Lys	Cys	Glu	Lys	His	Ala	His	Leu	Tyr	Arg	Lys	Leu				
					755		760			765									
acc	acc	aac	atc	ctg	ggc	ggt	tgc	atc	cag	atg	gtc	ctg	ggt	cag	att		2413		
Thr	Thr	Asn	Ile	Leu	Gly	Gly	Cys	Ile	Gln	Met	Val	Leu	Gly	Gln	Ile				
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gaa	gac	cac	aga	cga	acc	cac	cg	ccc	atc	caa	atc	cca	tcc	ttt	gat		2461		
Glu	Asp	His	Arg	Arg	Thr	His	Arg	Pro	Ile	Gln	Ile	Pro	Phe	Phe	Asp				
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gt	ttt	ctc	aga	tat	ctg	tgc	cag	gg	tcc	agt	gag	gaa	atg	aag	aaa		2509		
Val	Phe	Leu	Arg	Tyr	Leu	Cys	Gln	Gly	Ser	Ser	Glu	Glu	Met	Lys	Lys				
					805			810			815								
aac	agg	tac	tgg	gag	aag	gt	gag	gt	tcc	tcc	aa	cc	cag	cg	gg		2557		
Asn	Arg	Tyr	Trp	Glu	Lys	Val	Glu	Val	Ser	Ser	Asn	Pro	Gln	Arg	Ala				
					820			825			830								
agc	agg	ctg	acg	gac	cg	cc	aag	acc	tac	tgg	gag	tcc	agt	gg			2605		
Ser	Arg	Leu	Thr	Asp	Arg	Asn	Pro	Lys	Thr	Tyr	Trp	Glu	Ser	Ser	Gly				
					835			840			845								
agg	gcc	ggc	tcc	cac	ttc	atc	acc	tta	cac	atg	cg	cc	gg	gt	tc	atc		2653	
Arg	Ala	Gly	Ser	His	Phe	Ile	Thr	Leu	His	Met	Arg	Pro	Gly	Val	Ile				
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865					870				875						880		
cca	gcc	tgg	gtg	gtg	gta	tgc	ggg	ggc	aac	agc	atc	aag	tcc	gtt	aat		2749
Pro	Ala	Trp	Val	Val	Val	Cys	Gly	Gly	Asn	Ser	Ile	Lys	Ser	Val	Asn		
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aaa	gaa	ctc	aac	acg	gta	aac	gtg	atg	ccc	tct	gcc	agc	cgg	gtg	acc		2797
Lys	Glu	Leu	Asn	Thr	Val	Asn	Val	Met	Pro	Ser	Ala	Ser	Arg	Val	Thr		
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ctc	ctg	gag	aac	ctg	acc	cgc	ttc	tgg	ccc	atc	atc	caa	atc	aga	ata		2845
Leu	Leu	Glu	Asn	Leu	Thr	Arg	Phe	Trp	Pro	Ile	Ile	Gln	Ile	Arg	Ile		
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aag	cgc	tgc	cag	cag	ggt	ggc	att	aac	acg	cgc	atc	cgg	ggc	cta	gag		2893
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gtg	ctg	ggc	ccc	aag	ccc	acc	ttc	tgg	cca	gtg	ttc	cga	gag	caa	ctg		2941
Val	Leu	Gly	Pro	Lys	Pro	Thr	Phe	Trp	Pro	Val	Phe	Arg	Glu	Gln	Leu		
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tgc	cgg	cac	acg	cgc	ctc	ttc	tac	atg	gtt	cgg	gcc	cag	gca	tgg	agt		2989
Cys	Arg	His	Thr	Arg	Leu	Phe	Tyr	Met	Val	Arg	Ala	Gln	Ala	Trp	Ser		
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cag	gac	ata	gca	gag	gac	cgc	cgg	agc	ctt	ctg	cac	ctg	agt	tct	agg		3037
Gln	Asp	Ile	Ala	Glu	Asp	Arg	Arg	Ser	Leu	Leu	His	Leu	Ser	Ser	Arg		
					980				985					990			
cta	aat	ggg	gct	ctg	cgc	cat	gaa	cag	aat	ttt	gca	gag	cgc	ttc	ctt		3085
Leu	Asn	Gly	Ala	Leu	Arg	His	Glu	Gln	Asn	Phe	Ala	Glu	Arg	Phe	Leu		
					995				1000					1005			
cct	gat	atg	gag	gcc	gcc	caa	gca	ctg	agc	aag	acc	tgc	tgg	gag			3130
Pro	Asp	Met	Glu	Ala	Ala	Gln	Ala	Leu	Ser	Lys	Thr	Cys	Trp	Glu			
					1010				1015					1020			
gcg	ctg	gtc	agc	ccc	ctg	gtg	cag	aac	att	aca	tct	ccc	gat	gag			3175
Ala	Leu	Val	Ser	Pro	Leu	Val	Gln	Asn	Ile	Thr	Ser	Pro	Asp	Glu			
					1025				1030					1035			
gac	agc	acc	agc	tcc	ttg	ggc	tgg	ctg	ctg	gat	cag	tac	ttg	gga			3220
Asp	Ser	Thr	Ser	Ser	Leu	Gly	Trp	Leu	Leu	Asp	Gln	Tyr	Leu	Gly			
					1040				1045					1050			
tgc	agg	gag	gct	gcc	tac	aat	ccc	cag	agc	agg	gct	gct	gct	ttc			3265
Cys	Arg	Glu	Ala	Ala	Tyr	Asn	Pro	Gln	Ser	Arg	Ala	Ala	Ala	Phe			
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tcc	tcc	cg	gtt	cgc	cgc	ctt	acc	cac	ctc	ctg	gtc	cat	gtg	gag			3310
Ser	Ser	Arg	Val	Arg	Arg	Leu	Thr	His	Leu	Leu	Val	His	Val	Glu			
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ccc	cgt	gag	gca	gca	cct	ccg	gtg	gtg	gcc	atc	cct	cga	tcc	aag			3355
Pro	Arg	Glu	Ala	Ala	Pro	Pro	Val	Val	Ala	Ile	Pro	Arg	Ser	Lys			
					1085				1090					1095			
ggc	agg	aac	aga	atc	cat	gac	tgg	agc	tac	ttg	atc	acc	cgg	ggc			3400
Gly	Arg	Asn	Arg	Ile	His	Asp	Trp	Ser	Tyr	Leu	Ile	Thr	Arg	Gly			
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Val	Val	Glu	Glu	Gln	Met	Asn	Lys	Phe	Leu	Ser	Ala	Ser	Trp	Lys		
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gac	gat	gat	ttc	gta	ccc	cgc	tat	tgc	gag	cgc	tat	tac	gtc	ctg		3535
Asp	Asp	Asp	Phe	Val	Pro	Arg	Tyr	Cys	Glu	Arg	Tyr	Tyr	Val	Leu		
1145						1150					1155					
cag	aag	tcc	agc	tca	gag	ctg	ttt	ggg	cca	cga	gct	gcc	ttc	ttg		3580
Gln	Lys	Ser	Ser	Ser	Glu	Leu	Phe	Gly	Pro	Arg	Ala	Ala	Phe	Leu		
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ctg	gca	atg	cgg	aat	ggc	tgt	gct	gat	gct	gtg	cgg	agg	ctc	cct		3625
Leu	Ala	Met	Arg	Asn	Gly	Cys	Ala	Asp	Ala	Val	Arg	Arg	Leu	Pro		
1175						1180					1185					
ttc	ctc	agg	gcc	gcc	cat	gtg	aag	cag	cag	ttt	gct	cgg	cac	att		3670
Phe	Leu	Arg	Ala	Ala	His	Val	Lys	Gln	Gln	Phe	Ala	Arg	His	Ile		
1190						1195					1200					
gac	cag	agg	atc	caa	ggc	agt	agg	atg	ggt	gga	gcc	cgg	gga	atg		3715
Asp	Gln	Arg	Ile	Gln	Gly	Ser	Arg	Met	Gly	Gly	Ala	Arg	Gly	Met		
1205						1210					1215					
gag	atg	ctg	gca	cag	ttg	cag	cga	tgc	ctg	gag	tct	gtc	ctg	att		3760
Glu	Met	Leu	Ala	Gln	Leu	Gln	Arg	Cys	Leu	Glu	Ser	Val	Leu	Ile		
1220						1225					1230					
ttc	tct	ccc	ctg	gag	ata	gcc	acc	acc	ttt	gag	cat	tac	tac	cag		3805
Phe	Ser	Pro	Leu	Glu	Ile	Ala	Thr	Thr	Phe	Glut	His	Tyr	Tyr	Gln		
1235						1240					1245					
cac	tac	atg	gct	gac	cgt	ctc	ctg	agc	gta	ggc	tcc	agc	tgg	ctg		3850
His	Tyr	Met	Ala	Asp	Arg	Leu	Leu	Ser	Val	Gly	Ser	Ser	Trp	Leu		
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gag	ggg	gcc	gta	ctg	gag	cag	atc	ggt	ccc	tgc	ttc	ccc	agc	cgt		3895
Glu	Gly	Ala	Val	Leu	Glu	Gln	Ile	Gly	Pro	Cys	Phe	Pro	Ser	Arg		
1265						1270					1275					
ctt	ccc	cag	cag	atg	cta	cag	agc	ctg	aac	gtc	tca	gag	gag	ttg		3940
Leu	Pro	Gln	Gln	Met	Leu	Gln	Ser	Leu	Asn	Val	Ser	Glu	Glu	Leu		
1280						1285					1290					
cag	cgt	cag	tcc	cac	gtt	tac	cag	ctg	cag	cag	ctt	gat	cag	gag		3985
Gln	Arg	Gln	Phe	His	Val	Tyr	Gln	Leu	Gln	Gln	Leu	Asp	Gln	Glu		
1295						1300					1305					
ctc	ctg	aag	ctg	gaa	gac	acg	gaa	aag	aag	ata	cag	gtg	gcc	cat		4030
Leu	Leu	Lys	Leu	Glu	Asp	Thr	Glu	Lys	Lys	Ile	Gln	Val	Ala	His		
1310						1315					1320					
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Glu	Asp	Ser	Gly	Arg	Glu	Asp	Lys	Ser	Lys	Lys	Glu	Glu	Ala	Ile		
1325						1330					1335					
gga	gaa	gcc	gcg	gct	gtg	gct	atg	gca	gag	gag	gag	gat	caa	ggg		4120
Gly	Glu	Ala	Ala	Ala	Val	Ala	Met	Ala	Glu	Glu	Glu	Asp	Gln	Gly		

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aag 1340	1345	1350	
Lys 1355	Glu 1360	Glu 1365	4165
gaa 1370	gag 1375	gag 1380	4210
Glu 1370	Arg 1375	Arg 1380	
gtc 1385	gtg 1390	gtc 1395	4255
Val 1385	Val 1390	Val 1395	
ctc 1400	aac 1405	ccc 1410	4300
Leu 1400	Asn 1405	Pro 1410	
aac 1415	cac 1420	gca 1425	4345
Asn 1415	His 1420	Asn 1425	
tta 1430	gag 1435	ctg 1440	4390
Leu 1430	Glu 1435	Leu 1440	
cgg 1445	gca 1450	cat 1455	4435
Arg 1445	Ala 1450	His 1455	
gta 1460	cag 1465	ctc 1470	4480
Val 1460	Gln 1465	Leu 1470	
tct 1475	gtc 1480	atc 1485	4525
Ser 1475	Val 1480	Ile 1485	
ctt 1490	cac 1495	ctc 1500	4570
Leu 1490	His 1495	Leu 1500	
gac 1505	ctg 1510	gta 1515	4615
Asp 1505	Gln 1510	Val 1515	
cga 1520	gat 1525	agg 1530	4660
Arg 1520	Asp 1525	Arg 1530	
ctg 1535	atc 1540	cta 1545	4705
Leu 1535	Ile 1540	Leu 1545	
cgg 1550	aac 1555	aat 1560	4750
Arg 1550	Asn 1555	Asn 1560	
cga 1565	atc 1570	gat 1575	4795
Arg 1565	Ile 1570	Asp 1575	
ctc 1580	gtc 1585	tgt 1590	4840
		Page 7	

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Leu	Val	Tyr	Leu	Val	Leu	Glu	Ala	Trp	Glu	Lys	Gly	Pro	Cys	Pro	
1580					1585					1590					
gct	agg	ggt	ctg	gtc	agc	agc	ctc	ggc	agg	gga	gca	acc	tgc	agg	4885
Ala	Arg	Gly	Leu	Val	Ser	Ser	Leu	Gly	Arg	Gly	Ala	Thr	Cys	Arg	
1595					1600					1605					
agc	tct	gat	gtc	ctc	tcc	tgc	atc	ctg	cac	ctc	ctg	gtc	aag	ggc	4930
Ser	Ser	Asp	Val	Leu	Ser	Cys	Ile	Leu	His	Leu	Leu	Val	Lys	Gly	
1610					1615					1620					
acg	ctg	aga	cgc	cat	gac	gac	cg	ccg	cag	gtg	ctg	tac	tat	gca	4975
Thr	Leu	Arg	Arg	His	Asp	Asp	Arg	Pro	Gln	Val	Leu	Tyr	Tyr	Ala	
1625					1630					1635					
gtt	cct	gta	act	gtg	atg	gag	ccc	cac	atg	gag	tcc	ctg	aac	cct	5020
Val	Pro	Val	Thr	Val	Met	Gl	Pro	His	Met	Gl	Ser	Leu	Asn	Pro	
1640					1645					1650					
ggc	tcg	gca	ggc	ccc	aat	cca	ccc	ctc	acc	tcc	cac	acc	ctg	cag	5065
Gly	Ser	Ala	Gly	Pro	Asn	Pro	Pro	Leu	Thr	Phe	His	Thr	Leu	Gln	
1655					1660					1665					
att	cga	tcc	cgg	ggt	gtg	cct	tac	gcc	tcc	tgc	act	gat	aac	cac	5110
Ile	Arg	Ser	Arg	Gly	Val	Pro	Tyr	Ala	Ser	Cys	Thr	Asp	Asn	His	
1670					1675					1680					
acc	ttc	tcc	act	ttc	cg	tag	ccctggat	at	gggg	ttgggg	gttaggtgagg				5161
Thr	Phe	Ser	Thr	Phe	Arg										
1685															
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 <213> mus musculus

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 20 25 30

Asn Gly His Pro Glu Tyr Gln Ile Arg Trp Leu Ile Leu Arg Arg Gly  
 35 40 45

Asp Asp Gly Asp Arg Asp Ser Thr Val Asp Cys Lys Ala Glu His Ile  
 50 55 60

Leu Leu Trp Met Ser Asp Asp Glu Ile Tyr Ala Asn Cys His Lys Met  
 65 70 75 80

Leu Gly Glu Asn Gly Gln Val Ile Ala Pro Ser Arg Glu Ser Thr Glu  
 85 90 95

iu-99.ST25.txt

Ala Gly Ala Leu Asp Lys Ser Val Leu Gly Glu Met Glu Thr Asp Val  
100 105 110

Lys Ser Leu Ile Gln Arg Ala Leu Arg Gln Leu Glu Glu Cys Val Gly  
115 120 125

Thr Val Pro Pro Ala Pro Leu Leu His Thr Val His Val Leu Ser Ala  
130 135 140

Tyr Ala Ser Ile Glu Pro Leu Thr Gly Ile Phe Lys Asp Arg Arg Val  
145 150 155 160

Val Asn Leu Leu Met His Met Leu Ser Ser Pro Asp Tyr Gln Ile Arg  
165 170 175

Trp Ser Ala Gly Arg Met Ile Gln Ala Leu Ser Ser His Asp Ala Gly  
180 185 190

Thr Arg Thr Gln Ile Leu Leu Ser Leu Ser Gln Gln Glu Ala Ile Glu  
195 200 205

Lys His Leu Asp Phe Asp Ser Arg Cys Ala Leu Leu Ala Leu Phe Ala  
210 215 220

Gln Ala Thr Leu Thr Glu His Pro Met Ser Phe Glu Gly Val Gln Leu  
225 230 235 240

Pro Gln Val Pro Gly Arg Leu Leu Phe Ser Leu Val Lys Arg Tyr Leu  
245 250 255

His Val Thr Phe Leu Leu Asp Arg Leu Asn Gly Asp Ala Gly Asp Gln  
260 265 270

Gly Ala Gln Asn Asn Phe Ser Pro Glu Glu Leu Asn Val Gly Arg Gly  
275 280 285

Arg Leu Glu Leu Glu Phe Ser Met Ala Met Gly Thr Leu Ile Ser Glu  
290 295 300

Leu Val Gln Ala Met Arg Trp Asp Gly Ala Ser Ser Arg Pro Glu Ser  
305 310 315 320

Ser Ser Ser Ser Thr Phe Gln Pro Arg Pro Ala Gln Phe Arg Pro Tyr  
325 330 335

Thr Gln Arg Phe Arg Arg Ser Arg Arg Phe Arg Pro Arg Ala Ser Phe

340

345

350

Ala Ser Phe Asn Thr Tyr Ala Leu Tyr Val Arg Asp Thr Leu Arg Pro  
 355 360 365

Gly Met Arg Val Arg Met Leu Glu Asn Tyr Glu Glu Ile Ala Ala Gly  
 370 375 380

Asp Glu Gly Gln Phe Arg Gln Ser Asn Asp Gly Val Pro Pro Ala Gln  
 385 390 395 400

Val Leu Trp Asp Ser Thr Gly His Thr Tyr Trp Val His Trp His Met  
 405 410 415

Leu Glu Ile Leu Gly Phe Glu Glu Asp Ile Glu Asp Val Ile Asp Ile  
 420 425 430

Glu Glu Leu Gln Glu Leu Gly Ala Asn Gly Ala Leu Ser Ile Val Pro  
 435 440 445

Pro Ser Gln Arg Trp Lys Pro Ile Thr Gln Leu Phe Ala Glu Pro Tyr  
 450 455 460

Val Val Pro Glu Glu Glu Asp Arg Glu Glu Ser Glu Asn Leu Thr Gln  
 465 470 475 480

Ala Glu Trp Trp Glu Leu Leu Phe Phe Ile Arg Gln Leu Ser Glu Ala  
 485 490 495

Glu Arg Leu His Ile Val Asp Leu Leu Gln Asp His Leu Glu Glu Glu  
 500 505 510

Arg Val Leu Asp Tyr Asp Met Leu Pro Glu Leu Thr Val Pro Val Asp  
 515 520 525

Leu Ala Gln Asp Leu Leu Leu Ser Leu Pro Gln Gln Leu Glu Asp Ser  
 530 535 540

Ala Leu Arg Asp Leu Phe Ser Cys Ser Val Tyr Arg Lys Tyr Gly Pro  
 545 550 555 560

Glu Val Leu Val Gly His Leu Ser Tyr Pro Phe Val Pro Gly Ala Gln  
 565 570 575

Pro Asn Leu Phe Gly Ala Asn Glu Glu Ser Glu Ala Lys Asp Pro Pro  
 580 585 590

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Leu Gln Ser Ala Ser Pro Ala Leu Gln Arg Leu Val Glu Ser Leu Gly  
595 600 605

Pro Glu Gly Glu Val Leu Val Glu Leu Glu Gln Ala Leu Gly Ser Glu  
610 615 620

Ala Pro Gln Glu Thr Glu Val Lys Ser Cys Leu Leu Gln Leu Gln Glu  
625 630 635 640

Gln Pro Gln Pro Phe Leu Ala Leu Met Arg Ser Leu Asp Thr Ser Ala  
645 650 655

Ser Asn Lys Thr Leu His Leu Thr Val Leu Arg Ile Leu Met Gln Leu  
660 665 670

Val Asn Phe Pro Glu Ala Leu Leu Leu Pro Trp His Glu Ala Met Asp  
675 680 685

Ala Cys Val Thr Cys Leu Arg Ser Pro Asn Thr Asp Arg Glu Val Leu  
690 695 700

Gln Glu Leu Ile Phe Phe Leu His Arg Leu Thr Thr Thr Ser Arg Asp  
705 710 715 720

Tyr Ala Val Ile Leu Asn Gln His Gly Ala Arg Asp Ala Ile Ser Lys  
725 730 735

Val Leu Glu Lys His Arg Gly Lys Leu Glu Leu Ala Gln Glu Leu Arg  
740 745 750

Asp Met Val Ser Lys Cys Glu Lys His Ala His Leu Tyr Arg Lys Leu  
755 760 765

Thr Thr Asn Ile Leu Gly Gly Cys Ile Gln Met Val Leu Gly Gln Ile  
770 775 780

Glu Asp His Arg Arg Thr His Arg Pro Ile Gln Ile Pro Phe Phe Asp  
785 790 795 800

Val Phe Leu Arg Tyr Leu Cys Gln Gly Ser Ser Glu Glu Met Lys Lys  
805 810 815

Asn Arg Tyr Trp Glu Lys Val Glu Val Ser Ser Asn Pro Gln Arg Ala  
820 825 830

Ser Arg Leu Thr Asp Arg Asn Pro Lys Thr Tyr Trp Glu Ser Ser Gly  
835 840 845

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Arg Ala Gly Ser His Phe Ile Thr Leu His Met Arg Pro Gly Val Ile  
850 855 860

Ile Arg Gln Leu Thr Leu Leu Val Ala Gly Glu Asp Ser Ser Tyr Met  
865 870 875 880

Pro Ala Trp Val Val Val Cys Gly Gly Asn Ser Ile Lys Ser Val Asn  
885 890 895

Lys Glu Leu Asn Thr Val Asn Val Met Pro Ser Ala Ser Arg Val Thr  
900 905 910

Leu Leu Glu Asn Leu Thr Arg Phe Trp Pro Ile Ile Gln Ile Arg Ile  
915 920 925

Lys Arg Cys Gln Gln Gly Gly Ile Asn Thr Arg Ile Arg Gly Leu Glu  
930 935 940

Val Leu Gly Pro Lys Pro Thr Phe Trp Pro Val Phe Arg Glu Gln Leu  
945 950 955 960

Cys Arg His Thr Arg Leu Phe Tyr Met Val Arg Ala Gln Ala Trp Ser  
965 970 975

Gln Asp Ile Ala Glu Asp Arg Arg Ser Leu Leu His Leu Ser Ser Arg  
980 985 990

Leu Asn Gly Ala Leu Arg His Glu Gln Asn Phe Ala Glu Arg Phe Leu  
995 1000 1005

Pro Asp Met Glu Ala Ala Gln Ala Leu Ser Lys Thr Cys Trp Glu  
1010 1015 1020

Ala Leu Val Ser Pro Leu Val Gln Asn Ile Thr Ser Pro Asp Glu  
1025 1030 1035

Asp Ser Thr Ser Ser Leu Gly Trp Leu Leu Asp Gln Tyr Leu Gly  
1040 1045 1050

Cys Arg Glu Ala Ala Tyr Asn Pro Gln Ser Arg Ala Ala Ala Phe  
1055 1060 1065

Ser Ser Arg Val Arg Arg Leu Thr His Leu Leu Val His Val Glu  
1070 1075 1080

Pro Arg Glu Ala Ala Pro Pro Val Val Ala Ile Pro Arg Ser Lys  
1085 1090 1095

iu-99.ST25.txt

Gly Arg Asn Arg Ile His Asp Trp Ser Tyr Leu Ile Thr Arg Gly  
1100 1105 1110

Leu Pro Ser Ser Ile Met Lys Asn Leu Thr Arg Cys Trp Arg Ser  
1115 1120 1125

Val Val Glu Glu Gln Met Asn Lys Phe Leu Ser Ala Ser Trp Lys  
1130 1135 1140

Asp Asp Asp Phe Val Pro Arg Tyr Cys Glu Arg Tyr Tyr Val Leu  
1145 1150 1155

Gln Lys Ser Ser Ser Glu Leu Phe Gly Pro Arg Ala Ala Phe Leu  
1160 1165 1170

Leu Ala Met Arg Asn Gly Cys Ala Asp Ala Val Arg Arg Leu Pro  
1175 1180 1185

Phe Leu Arg Ala Ala His Val Lys Gln Gln Phe Ala Arg His Ile  
1190 1195 1200

Asp Gln Arg Ile Gln Gly Ser Arg Met Gly Gly Ala Arg Gly Met  
1205 1210 1215

Glu Met Leu Ala Gln Leu Gln Arg Cys Leu Glu Ser Val Leu Ile  
1220 1225 1230

Phe Ser Pro Leu Glu Ile Ala Thr Thr Phe Glu His Tyr Tyr Gln  
1235 1240 1245

His Tyr Met Ala Asp Arg Leu Leu Ser Val Gly Ser Ser Trp Leu  
1250 1255 1260

Glu Gly Ala Val Leu Glu Gln Ile Gly Pro Cys Phe Pro Ser Arg  
1265 1270 1275

Leu Pro Gln Gln Met Leu Gln Ser Leu Asn Val Ser Glu Glu Leu  
1280 1285 1290

Gln Arg Gln Phe His Val Tyr Gln Leu Gln Gln Leu Asp Gln Glu  
1295 1300 1305

Leu Leu Lys Leu Glu Asp Thr Glu Lys Lys Ile Gln Val Ala His  
1310 1315 1320

Glu Asp Ser Gly Arg Glu Asp Lys Ser Lys Lys Glu Glu Ala Ile

## iu-99.ST25.txt

1325	1330	1335												
Gly	Glu	Ala	Ala	Ala	Val	Ala	Met	Ala	Glu	Glu	Glu	Asp	Gln	Gly
1340		1345				1350			1350					
Lys	Lys	Glu	Glu	Gly	Glu	Glu	Glu	Gly	Glu	Gly	Glu	Asp	Glu	Glu
1355		1360				1365			1365					
Glu	Glu	Arg	Tyr	Tyr	Lys	Gly	Thr	Met	Pro	Glu	Val	Cys	Val	Leu
1370		1375			1380									
Val	Val	Thr	Pro	Arg	Phe	Trp	Pro	Val	Ala	Ser	Val	Cys	Gln	Met
1385		1390			1395									
Leu	Asn	Pro	Ala	Thr	Cys	Leu	Pro	Ala	Tyr	Leu	Arg	Gly	Thr	Ile
1400		1405			1410									
Asn	His	Tyr	Thr	Asn	Phe	Tyr	Ser	Lys	Ser	Gln	Ser	Arg	Ser	Ser
1415		1420			1425									
Leu	Glu	Lys	Glu	Pro	Gln	Arg	Arg	Leu	Gln	Trp	Thr	Trp	Gln	Gly
1430		1435			1440									
Arg	Ala	Glu	Val	Gln	Phe	Gly	Gly	Gln	Ile	Leu	His	Val	Ser	Thr
1445		1450			1455									
Val	Gln	Met	Trp	Leu	Leu	Leu	His	Leu	Asn	Asn	Gln	Lys	Glu	Val
1460		1465			1470									
Ser	Val	Glu	Ser	Leu	Gln	Ala	Ile	Ser	Glu	Leu	Pro	Pro	Asp	Val
1475		1480			1485									
Leu	His	Arg	Ala	Ile	Gly	Pro	Leu	Thr	Ser	Ser	Arg	Gly	Pro	Leu
1490		1495			1500									
Asp	Leu	Gln	Glu	Gln	Lys	Asn	Val	Pro	Gly	Gly	Val	Leu	Lys	Ile
1505		1510			1515									
Arg	Asp	Asp	Ser	Glu	Glu	Pro	Arg	Pro	Arg	Arg	Gly	Asn	Val	Trp
1520		1525			1530									
Leu	Ile	Pro	Pro	Gln	Thr	Tyr	Leu	Gln	Ala	Glu	Ala	Glu	Glu	Gly
1535		1540			1545									
Arg	Asn	Met	Glu	Lys	Arg	Arg	Asn	Leu	Leu	Asn	Cys	Leu	Val	Val
1550		1555			1560									

Arg Ile Leu Lys Ala His Gly Asp Glu Gly Leu His Val Asp Arg  
 1565 1570 1575

Leu Val Tyr Leu Val Leu Glu Ala Trp Glu Lys Gly Pro Cys Pro  
 1580 1585 1590

Ala Arg Gly Leu Val Ser Ser Leu Gly Arg Gly Ala Thr Cys Arg  
 1595 1600 1605

Ser Ser Asp Val Leu Ser Cys Ile Leu His Leu Leu Val Lys Gly  
 1610 1615 1620

Thr Leu Arg Arg His Asp Asp Arg Pro Gln Val Leu Tyr Tyr Ala  
 1625 1630 1635

Val Pro Val Thr Val Met Glu Pro His Met Glu Ser Leu Asn Pro  
 1640 1645 1650

Gly Ser Ala Gly Pro Asn Pro Pro Leu Thr Phe His Thr Leu Gln  
 1655 1660 1665

Ile Arg Ser Arg Gly Val Pro Tyr Ala Ser Cys Thr Asp Asn His  
 1670 1675 1680

Thr Phe Ser Thr Phe Arg  
 1685

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 Met Val Gly Glu Leu Arg Tyr Arg Glu  
 1 5

ttc agg gtg ccc ctg ggg ccc ggc tta cat gcc tat cct gat gag ctg 161  
 Phe Arg Val Pro Leu Gly Pro Gly Leu His Ala Tyr Pro Asp Glu Leu  
 10 15 20 25

atc cgc cag cgc gtg ggc cat gat ggg cat cct gag tac cag atc cgt 209  
 Ile Arg Gln Arg Val Gly His Asp Gly His Pro Glu Tyr Gln Ile Arg  
 30 35 40

tgg ctc atc ctg cgg cgt ggc gat gag ggg gac ggg ggc tct ggc caa 257  
 Trp Leu Ile Leu Arg Arg Gly Asp Glu Gly Asp Gly Gly Ser Gly Gln

## iu-99.ST25.txt

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gtg gac tgc aag gct gag cac atc ctg ctg tgg atg tcc aag gat gag			305
Val Asp Cys Lys Ala Glu His Ile Leu Leu Trp Met Ser Lys Asp Glu			
60	65	70	
atc tat gcc aac tgc cac aag atg ctg ggc gag gat ggc cag gtc atc			353
Ile Tyr Ala Asn Cys His Lys Met Leu Gly Glu Asp Gly Gln Val Ile			
75	80	85	
ggg ccc tcc cag gag tct gca ggg gag gtt ggg gcc ctg gac aaa tct			401
Gly Pro Ser Gln Glu Ser Ala Gly Glu Val Gly Ala Leu Asp Lys Ser			
90	95	100	105
gtg ctg gag gag atg gaa acc gat gtg aag tcc ctc att cag aga gac			449
Val Leu Glu Glu Met Glu Thr Asp Val Lys Ser Leu Ile Gln Arg Ala			
110	115	120	
ctt cgg cag ctg gag gag tgt gtg ggc act atc cct cct gct cct cta			497
Leu Arg Gln Leu Glu Glu Cys Val Gly Thr Ile Pro Pro Ala Pro Leu			
125	130	135	
ctt cac act gtc cac gtg ctc agc gcc tat gcc agc att gag ccc ctc			545
Leu His Thr Val His Val Leu Ser Ala Tyr Ala Ser Ile Glu Pro Leu			
140	145	150	
act gga gta ttc aag gac cca agg gtc ctg gac ttg ctc atg cac atg			593
Thr Gly Val Phe Lys Asp Pro Arg Val Leu Asp Leu Leu Met His Met			
155	160	165	
ttg agt agt cct gat tat cag att cgc tgg agt gca ggc cgg atg ata			641
Leu Ser Ser Pro Asp Tyr Gln Ile Arg Trp Ser Ala Gly Arg Met Ile			
170	175	180	185
caa gcc ctg tcc tcc cat gac gct ggg acc cgg act cag atc ctt ctg			689
Gln Ala Leu Ser Ser His Asp Ala Gly Thr Arg Thr Gln Ile Leu Leu			
190	195	200	
tca ctg agc caa caa gaa gcc att gag aaa cac ctg gat ttt gac agc			737
Ser Leu Ser Gln Gln Glu Ala Ile Glu Lys His Leu Asp Phe Asp Ser			
205	210	215	
cgc tgt gct ctg cta gca ctg ttt gca cag gcc acg ctc tct gaa cac			785
Arg Cys Ala Leu Leu Ala Leu Phe Ala Gln Ala Thr Leu Ser Glu His			
220	225	230	
ccc atg tct ttc gag ggc att cag cta cca cag gtc cca gga agg gtg			833
Pro Met Ser Phe Glu Gly Ile Gln Leu Pro Gln Val Pro Gly Arg Val			
235	240	245	
ctc ttc tcc ctg gtg aag cgg tat ttg cat gtc acc tcg ctc ctg gat			881
Leu Phe Ser Leu Val Lys Arg Tyr Leu His Val Thr Ser Leu Leu Asp			
250	255	260	265
cag ctg aac gac agt gct gcg gag cca gga gcc cag aac acc tct gct			929
Gln Leu Asn Asp Ser Ala Ala Glu Pro Gly Ala Gln Asn Thr Ser Ala			
270	275	280	
cct gag gag ttg agt ggg gag agg ggt caa ctg gag ctg gag ttc agt			977
Pro Glu Glu Leu Ser Gly Glu Arg Gly Gln Leu Glu Leu Glu Phe Ser			
285	290	295	
atg gcc atg ggc acc ctg atc tcg gag ctg gtg caa gcc atg cgc tgg			1025

## iu-99.ST25.txt

Met	Ala	Met	Gly	Thr	Leu	Ile	Ser	Glu	Leu	Val	Gln	Ala	Met	Arg	Trp	
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gac	cag	gcc	tca	gac	aga	cca	agg	agc	tca	gca	cgg	tcc	ccc	ggg	tcc	1073
Asp	Gln	Ala	Ser	Asp	Arg	Pro	Arg	Ser	Ser	Ala	Arg	Ser	Pro	Gly	Ser	
315					320						325					
atc	ttc	cag	cct	cag	ctg	gca	gat	gtg	agc	cca	ggg	ctc	ccc	gct	gcc	1121
Ile	Phe	Gln	Pro	Gln	Leu	Ala	Asp	Val	Ser	Pro	Gly	Leu	Pro	Ala	Ala	
330					335				340			345				
cag	gct	cag	ccc	tcc	ttc	agg	agg	tca	aga	cgt	ttt	cgc	cct	cgt	tct	1169
Gln	Ala	Gln	Pro	Ser	Phe	Arg	Arg	Ser	Arg	Arg	Phe	Arg	Pro	Arg	Ser	
						350			355			360				
gag	ttc	gca	agt	ggc	aat	acc	tat	gct	ttg	tat	gtg	cgg	gac	aca	ctg	1217
Glu	Phe	Ala	Ser	Gly	Asn	Thr	Tyr	Ala	Leu	Tyr	Val	Arg	Asp	Thr	Leu	
					365			370			375					
cag	ccg	ggg	atg	cga	gtg	cgg	atg	ctg	gat	gat	tat	gag	gag	atc	agt	1265
Gln	Pro	Gly	Met	Arg	Val	Arg	Met	Leu	Asp	Asp	Tyr	Glu	Glu	Ile	Ser	
					380			385			390					
gcc	ggg	gat	gag	ggc	gag	ttt	cg	cag	agc	aac	aac	ggt	gtg	cct	cct	1313
Ala	Gly	Asp	Glu	Gly	Glu	Phe	Arg	Gln	Ser	Asn	Asn	Gly	Val	Pro	Pro	
					395			400			405					
gtg	cag	gta	ttt	tgg	gag	tca	aca	ggc	cgc	acc	tat	tgg	gtg	cac	tgg	1361
Val	Gln	Val	Phe	Trp	Glu	Ser	Thr	Gly	Arg	Thr	Tyr	Trp	Val	His	Trp	
					410			415			420			425		
cac	atg	ctg	gag	atc	ttg	ggc	ttt	gag	gaa	gac	att	gag	gac	atg	gtt	1409
His	Met	Leu	Glu	Ile	Leu	Gly	Phe	Glu	Glu	Asp	Ile	Glu	Asp	Met	Val	
					430				435			440				
gag	gct	gat	gag	tac	caa	ggg	gca	gtg	gcc	agt	aga	gtc	ctg	ggt	aga	1457
Glu	Ala	Asp	Glu	Tyr	Gln	Gly	Ala	Val	Ala	Ser	Arg	Val	Leu	Gly	Arg	
					445			450			455					
gcc	ctg	cct	gcc	tgg	cgc	tgg	agg	ccc	atg	aca	gaa	ctc	tat	gct	gtg	1505
Ala	Leu	Pro	Ala	Trp	Arg	Trp	Arg	Pro	Met	Thr	Glu	Leu	Tyr	Ala	Val	
					460			465			470					
cct	tat	gtg	ctg	cct	gag	gat	gag	gac	act	gag	gag	tgt	gaa	cac	ctg	1553
Pro	Tyr	Val	Leu	Pro	Glu	Asp	Glu	Asp	Thr	Glu	Glu	Cys	Glu	His	Leu	
					475			480			485					
acc	ctg	gct	gag	tgg	tgg	gaa	ctc	ctc	tcc	tcc	atc	aag	aag	ctg	gat	1601
Thr	Leu	Ala	Glu	Trp	Trp	Glu	Leu	Leu	Phe	Phe	Ile	Lys	Lys	Leu	Asp	
					490			495			500			505		
gga	cct	gac	cat	cag	gag	gtt	ctc	cag	atc	ctc	cag	gag	aac	cta	gat	1649
Gly	Pro	Asp	His	Gln	Glu	Val	Leu	Gln	Ile	Leu	Gln	Glu	Asn	Leu	Asp	
					510				515			520				
ggg	gag	att	ctg	gat	gat	gag	atc	cta	gct	gaa	ctg	gcc	gtg	ccc	ata	1697
Gly	Glu	Ile	Leu	Asp	Asp	Glu	Ile	Leu	Ala	Glu	Leu	Ala	Val	Pro	Ile	
					525			530			535					
gaa	ttg	gcc	cag	gac	ttg	ctg	ctg	act	ctg	cca	cag	cga	ctc	aat	gac	1745
Glu	Leu	Ala	Gln	Asp	Leu	Leu	Leu	Thr	Leu	Pro	Gln	Arg	Leu	Asn	Asp	
					540			545			550					

## iu-99.ST25.txt

agt gcc ctc agg gac ctg atc aac tgc cat gtc tac aag aag tat ggg	1793
Ser Ala Leu Arg Asp Leu Ile Asn Cys His Val Tyr Lys Lys Tyr Gly	
555 560 565	
cct gaa gcc cta gca ggg aac caa gcc tac cca tcc ctt cta gaa gcc	1841
Pro Glu Ala Leu Ala Gly Asn Gln Ala Tyr Pro Ser Leu Leu Glu Ala	
570 575 580 585	
caa gaa gat gtc ctc ctg cta gac gcg cag gcc cag gct aag gac tca	1889
Gln Glu Asp Val Leu Leu Asp Ala Gln Ala Gln Ala Lys Asp Ser	
590 595 600	
gaa gat gca gcc aaa gtg gaa gca aaa gaa ccc cca tct cag agt ccc	1937
Glu Asp Ala Ala Lys Val Glu Ala Lys Glu Pro Pro Ser Gln Ser Pro	
605 610 615	
aac act ccc ctg cag cgt ctg gtg gag ggt tat ggt cca gct ggg aaa	1985
Asn Thr Pro Leu Gln Arg Leu Val Glu Gly Tyr Gly Pro Ala Gly Lys	
620 625 630	
atc ctc ctg gat cta gag caa gcc ctc agc tca gag ggg acc cag gag	2033
Ile Leu Leu Asp Leu Glu Gln Ala Leu Ser Ser Glu Gly Thr Gln Glu	
635 640 645	
aac aag gtc aag cca ctc ctg cag ctg cag ctg cgg cag ccg cag ccc	2081
Asn Lys Val Lys Pro Leu Leu Gln Leu Gln Arg Gln Pro Gln Pro	
650 655 660 665	
ttc ctg gca ctg atg cag agc ctg gac act ccg gag act aac agg acc	2129
Phe Leu Ala Leu Met Gln Ser Leu Asp Thr Pro Glu Thr Asn Arg Thr	
670 675 680	
ctg cac ctg act gtg ctg aga atc ctg aag cag ctg gtg gac ttc ccc	2177
Leu His Leu Thr Val Leu Arg Ile Leu Lys Gln Leu Val Asp Phe Pro	
685 690 695	
gag gca ctg ctc ccc tgg cac gag gcc gtg gat gcc tgc atg gcc	2225
Glu Ala Leu Leu Leu Pro Trp His Glu Ala Val Asp Ala Cys Met Ala	
700 705 710	
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Cys Leu Arg Ser Pro Asn Thr Asp Arg Glu Val Leu Gln Glu Leu Ile	
715 720 725	
ttc ttc ctg cac cgc ctg acc tca gtg agc agg gac tat gcc gtg gtg	2321
Phe Phe Leu His Arg Leu Thr Ser Val Ser Arg Asp Tyr Ala Val Val	
730 735 740 745	
ctg aat cag ctg gga gca aga gac gct atc tcc aag gcc ctg gaa aag	2369
Leu Asn Gln Leu Gly Ala Arg Asp Ala Ile Ser Lys Ala Leu Glu Lys	
750 755 760	
cac ctg gga aag ctg gag ctg gct cag gag ctg cgg gac atg gtg ttc	2417
His Leu Gly Lys Leu Glu Leu Ala Gln Glu Leu Arg Asp Met Val Phe	
765 770 775	
aag tgt gag aag cat gcc cac ctc tac cgc aaa ctc atc acc aac atc	2465
Lys Cys Glu Lys His Ala His Leu Tyr Arg Lys Leu Ile Thr Asn Ile	
780 785 790	
ctg gga ggc tgc atc cag atg gtg ctg ggc cag atc gaa gac cac aga	2513
Leu Gly Gly Cys Ile Gln Met Val Leu Gly Gln Ile Glu Asp His Arg	
795 800 805	

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cga acc cac cgg ccc atc aac atc cct ttc ttt gat gtg ttc ctc ctc aga	2561
Arg Thr His Arg Pro Ile Asn Ile Pro Phe Phe Asp Val Phe Leu Arg	
810 815 820 825	
tac ctg tgc cag ggc tcc agt gtg gaa gtg aag gag gac aag tgc tgg	2609
Tyr Leu Cys Gln Gly Ser Ser Val Glu Val Lys Glu Asp Lys Cys Trp	
830 835 840	
gag aag gtg gag gtg tcc tcc aac ccc cac cgg gcc agc aag ctg acg	2657
Glu Lys Val Glu Val Ser Ser Asn Pro His Arg Ala Ser Lys Leu Thr	
845 850 855	
gac cac aac ccc aag acc tat tgg gag tcc aac ggc agc gcc ggc tcc	2705
Asp His Asn Pro Lys Thr Tyr Trp Glu Ser Asn Gly Ser Ala Gly Ser	
860 865 870	
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His Tyr Ile Thr Leu His Met Arg Arg Gly Ile Leu Ile Arg Gln Leu	
875 880 885	
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Thr Leu Leu Val Ala Ser Glu Asp Ser Ser Tyr Met Pro Ala Arg Val	
890 895 900 905	
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Val Val Cys Gly Gly Asp Ser Thr Ser Ser Leu His Thr Glu Leu Asn	
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tcg gtg aat gtg atg ccc tct gcc agc cgg gtg atc ctc ctg gag aac	2897
Ser Val Asn Val Met Pro Ser Ala Ser Arg Val Ile Leu Leu Glu Asn	
925 930 935	
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Leu Thr Arg Phe Trp Pro Ile Ile Gln Ile Arg Ile Lys Arg Cys Gln	
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Gln Gly Gly Ile Asp Thr Arg Ile Arg Gly Leu Glu Ile Leu Gly Pro	
955 960 965	
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Lys Pro Thr Phe Trp Pro Val Phe Arg Glu Gln Leu Cys Arg His Thr	
970 975 980 985	
cgc ctc ttc tac atg gtt cgg gca cag gcc tgg agc cag gac atg gca	3089
Arg Leu Phe Tyr Met Val Arg Ala Gln Ala Trp Ser Gln Asp Met Ala	
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Glu Asp Arg Arg Ser Leu Leu His Leu Ser Ser Arg Leu Asn Gly	
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cgg gtg cgc cgt ctc act cac ctg ctg gtg cat gtc gag ccc tgt Arg Val Arg Arg Leu Thr His Leu Leu Val His Val Glu Pro Cys 1095 1100 1105			3404
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gac ttt gtg cca cgc tac tgt gag cac ttt aat att ctg cag aac Asp Phe Val Pro Arg Tyr Cys Glu His Phe Asn Ile Leu Gln Asn 1170 1175 1180			3629
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gcc gtg ctg gag cag atc ggt ccc tgc ttc ccc aac cgc ctc ccc Page 20			3989

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Ala	Val	Leu	Glu	Gln	Ile	Gly	Pro	Cys	Phe	Pro	Asn	Arg	Leu	Pro	
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Gln	Gln	Met	Leu	Gln	Ser	Leu	Ser	Thr	Ser	Lys	Glu	Leu	Gln	Arg	
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cag	ttc	cac	gtc	tac	cag	ctc	cag	cag	ctg	gat	cag	gaa	ctc	cta	4079
Gln	Phe	His	Val	Tyr	Gln	Leu	Gln	Gln	Leu	Asp	Gln	Glu	Leu	Leu	
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Lys	Leu	Glu	Asp	Thr	Glu	Lys	Lys	Ile	Gln	Val	Gly	Leu	Gly	Ala	
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Ala	Leu	Glu	Arg	Gly	Ser	Gln	Arg	Arg	Leu	Gln	Trp	Thr	Trp	Leu	
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Gly	Trp	Ala	Glu	Leu	Gln	Phe	Gly	Asn	Gln	Thr	Leu	His	Val	Ser	
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Thr	Val	Gln	Met	Trp	Leu	Leu	Leu	Tyr	Leu	Asn	Asp	Leu	Lys	Ala	
1470								1475					1480		
gtc	tct	gtg	gag	agt	ctg	ctg	gcg	ttc	tca	ggg	ctc	tcc	gca	gac	4574
Val	Ser	Val	Glu	Ser	Leu	Leu	Ala	Phe	Ser	Gly	Leu	Ser	Ala	Asp	
1485								1490					1495		
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Met	Leu	Asn	Gln	Ala	Ile	Gly	Pro	Leu	Thr	Ser	Ser	Arg	Gly	Pro	
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ctg	gac	ctt	cac	gag	caa	aag	gat	ata	cca	gga	ggg	gtc	ctc	aag	4664
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Ile Leu Leu Trp Met Ser Lys Asp Glu Ile Tyr Ala Asn Cys His Lys  
 65 70 75 80

Met Leu Gly Glu Asp Gly Gln Val Ile Gly Pro Ser Gln Glu Ser Ala  
 85 90 95

Gly Glu Val Gly Ala Leu Asp Lys Ser Val Leu Glu Glu Met Glu Thr  
 100 105 110

Asp Val Lys Ser Leu Ile Gln Arg Ala Leu Arg Gln Leu Glu Glu Cys  
 115 120 125

Val Gly Thr Ile Pro Pro Ala Pro Leu Leu His Thr Val His Val Leu  
 130 135 140

Ser Ala Tyr Ala Ser Ile Glu Pro Leu Thr Gly Val Phe Lys Asp Pro  
 145 150 155 160

Arg Val Leu Asp Leu Leu Met His Met Leu Ser Ser Pro Asp Tyr Gln  
 165 170 175

Ile Arg Trp Ser Ala Gly Arg Met Ile Gln Ala Leu Ser Ser His Asp  
 180 185 190

Ala Gly Thr Arg Thr Gln Ile Leu Leu Ser Leu Ser Gln Gln Glu Ala  
 195 200 205

Ile Glu Lys His Leu Asp Phe Asp Ser Arg Cys Ala Leu Leu Ala Leu  
 210 215 220

Phe Ala Gln Ala Thr Leu Ser Glu His Pro Met Ser Phe Glu Gly Ile  
 225 230 235 240

Gln Leu Pro Gln Val Pro Gly Arg Val Leu Phe Ser Leu Val Lys Arg  
 245 250 255

Tyr Leu His Val Thr Ser Leu Leu Asp Gln Leu Asn Asp Ser Ala Ala  
 260 265 270

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Glu Pro Gly Ala Gln Asn Thr Ser Ala Pro Glu Glu Leu Ser Gly Glu  
275 280 285

Arg Gly Gln Leu Glu Leu Glu Phe Ser Met Ala Met Gly Thr Leu Ile  
290 295 300

Ser Glu Leu Val Gln Ala Met Arg Trp Asp Gln Ala Ser Asp Arg Pro  
305 310 315 320

Arg Ser Ser Ala Arg Ser Pro Gly Ser Ile Phe Gln Pro Gln Leu Ala  
325 330 335

Asp Val Ser Pro Gly Leu Pro Ala Ala Gln Ala Gln Pro Ser Phe Arg  
340 345 350

Arg Ser Arg Arg Phe Arg Pro Arg Ser Glu Phe Ala Ser Gly Asn Thr  
355 360 365

Tyr Ala Leu Tyr Val Arg Asp Thr Leu Gln Pro Gly Met Arg Val Arg  
370 375 380

Met Leu Asp Asp Tyr Glu Glu Ile Ser Ala Gly Asp Glu Gly Glu Phe  
385 390 395 400

Arg Gln Ser Asn Asn Gly Val Pro Pro Val Gln Val Phe Trp Glu Ser  
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Thr Gly Arg Thr Tyr Trp Val His Trp His Met Leu Glu Ile Leu Gly  
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Phe Glu Glu Asp Ile Glu Asp Met Val Glu Ala Asp Glu Tyr Gln Gly  
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Ala Val Ala Ser Arg Val Leu Gly Arg Ala Leu Pro Ala Trp Arg Trp  
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Arg Pro Met Thr Glu Leu Tyr Ala Val Pro Tyr Val Leu Pro Glu Asp  
465 470 475 480

Glu Asp Thr Glu Glu Cys Glu His Leu Thr Leu Ala Glu Trp Trp Glu  
485 490 495

Leu Leu Phe Phe Ile Lys Lys Leu Asp Gly Pro Asp His Gln Glu Val  
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Leu Gln Ile Leu Gln Glu Asn Leu Asp Gly Glu Ile Leu Asp Asp Glu  
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Ile Leu Ala Glu Leu Ala Val Pro Ile Glu Leu Ala Gln Asp Leu Leu  
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Asn Cys His Val Tyr Lys Lys Tyr Gly Pro Glu Ala Leu Ala Gly Asn  
565 570 575

Gln Ala Tyr Pro Ser Leu Leu Glu Ala Gln Glu Asp Val Leu Leu Leu  
580 585 590

Asp Ala Gln Ala Gln Ala Lys Asp Ser Glu Asp Ala Ala Lys Val Glu  
595 600 605

Ala Lys Glu Pro Pro Ser Gln Ser Pro Asn Thr Pro Leu Gln Arg Leu  
610 615 620

Val Glu Gly Tyr Gly Pro Ala Gly Lys Ile Leu Leu Asp Leu Glu Gln  
625 630 635 640

Ala Leu Ser Ser Glu Gly Thr Gln Glu Asn Lys Val Lys Pro Leu Leu  
645 650 655

Leu Gln Leu Gln Arg Gln Pro Gln Pro Phe Leu Ala Leu Met Gln Ser  
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Leu Asp Thr Pro Glu Thr Asn Arg Thr Leu His Leu Thr Val Leu Arg  
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Ile Leu Lys Gln Leu Val Asp Phe Pro Glu Ala Leu Leu Leu Pro Trp  
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His Glu Ala Val Asp Ala Cys Met Ala Cys Leu Arg Ser Pro Asn Thr  
705 710 715 720

Asp Arg Glu Val Leu Gln Glu Leu Ile Phe Phe Leu His Arg Leu Thr  
725 730 735

Ser Val Ser Arg Asp Tyr Ala Val Val Leu Asn Gln Leu Gly Ala Arg  
740 745 750

Asp Ala Ile Ser Lys Ala Leu Glu Lys His Leu Gly Lys Leu Glu Leu  
755 760 765

Ala Gln Glu Leu Arg Asp Met Val Phe Lys Cys Glu Lys His Ala His  
770 775 780

iu-99.ST25.txt

Leu Tyr Arg Lys Leu Ile Thr Asn Ile Leu Gly Gly Cys Ile Gln Met  
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Val Leu Gly Gln Ile Glu Asp His Arg Arg Thr His Arg Pro Ile Asn  
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Ile Pro Phe Phe Asp Val Phe Leu Arg Tyr Leu Cys Gln Gly Ser Ser  
820 825 830

Val Glu Val Lys Glu Asp Lys Cys Trp Glu Lys Val Glu Val Ser Ser  
835 840 845

Asn Pro His Arg Ala Ser Lys Leu Thr Asp His Asn Pro Lys Thr Tyr  
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Trp Glu Ser Asn Gly Ser Ala Gly Ser His Tyr Ile Thr Leu His Met  
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Arg Arg Gly Ile Leu Ile Arg Gln Leu Thr Leu Leu Val Ala Ser Glu  
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Asp Ser Ser Tyr Met Pro Ala Arg Val Val Val Cys Gly Gly Asp Ser  
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Thr Ser Ser Leu His Thr Glu Leu Asn Ser Val Asn Val Met Pro Ser  
915 920 925

Ala Ser Arg Val Ile Leu Leu Glu Asn Leu Thr Arg Phe Trp Pro Ile  
930 935 940

Ile Gln Ile Arg Ile Lys Arg Cys Gln Gln Gly Gly Ile Asp Thr Arg  
945 950 955 960

Ile Arg Gly Leu Glu Ile Leu Gly Pro Lys Pro Thr Phe Trp Pro Val  
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Phe Arg Glu Gln Leu Cys Arg His Thr Arg Leu Phe Tyr Met Val Arg  
980 985 990

Ala Gln Ala Trp Ser Gln Asp Met Ala Glu Asp Arg Arg Ser Leu Leu  
995 1000 1005

His Leu Ser Ser Arg Leu Asn Gly Ala Leu Arg Gln Glu Gln Asn  
1010 1015 1020

Phe Ala Asp Arg Phe Leu Pro Asp Asp Glu Ala Ala Gln Ala Leu  
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Leu Asp Gln Tyr Leu Glu Cys	Gln Glu Ala Val Phe	Asn Pro Gln
1070 1075 1080	1080	
Ser Arg Gly Pro Ala Phe Phe	Ser Arg Val Arg Arg	Leu Thr His
1085 1090 1095		
Leu Leu Val His Val Glu Pro	Cys Glu Ala Pro Pro	Pro Val Val
1100 1105 1110	1110	
Ala Thr Pro Arg Pro Lys Gly	Arg Asn Arg Ser His	Asp Trp Ser
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Leu Gln Ala Val Leu Ile Phe	Ser Gly Leu Glu Ile	Ala Thr Thr
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Phe Glu His Tyr Tyr Gln His Tyr Met Ala Asp Arg Leu Leu Gly  
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iu-99.ST25.txt

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